CHAPTER 10

The Assessment of Military-Related PTSD

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Since the diagnosis of posttraumatic stress disorder (PTSD) appeared in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) of the American Psychiatric Association (1980), objective measurement of the psychological effects of combat and other military stressors has grown rapidly. Studies by Wilson (1979) and Egendorf, Kadushin, Laufer, Rothbart, and Sloan (1981) were among the first attempts to quantify the psychological effects of war when these investigators systematically examined the psychological status of American veterans of the Vietnam War. Since that time, the growth in the quantity and quality of instruments designed to assess exposure to potentially traumatic events and PTSD symptomatology has been extensive. Initially driven by the demand for instruments to be used in clinic settings, this development was maintained by studies funded in the public interest to estimate the prevalence of exposure to traumatic events and the development of PTSD in our society.

Our first goal in this chapter is to present the model for assessing and diagnosing PTSD that originated in our research program in Jackson, Mississippi (Keane, Fairbank, Caddell, Zimering, & Bender, 1985) and that was refined and enhanced in the National Center for PTSD in Boston. This method is premised upon the notion that all measures of a disorder are imperfectly related to the condition and that multiple measures from different domains improve diagnostic accuracy and confidence. This multimethod approach to assessment of PTSD is valuable clinically because it taps numerous domains of functioning and thus assists the clinician in identifying multiple targets for in-

tervention. It is valuable in research because it increases the likelihood that patients classified as having PTSD for research purposes do indeed have PTSD.

A second purpose of this chapter is to review the extant literature on the development and evaluation of instruments that measure military-related trauma exposure and attendant PTSD. This is accomplished with an awareness of ongoing changes in the nature of military activities. As peacekeeping and humanitarian efforts increasingly become primary functions of military troops, members of the military are exposed to unique stressors. Efforts to quantify these experiences require a specific methodology that will permit the stable measurement of the complex life events for those serving in these roles. We offer one possible methodology for clinicians and researchers to employ when confronted with measuring stressor exposure in a unique environment and setting.

In addition to the ongoing changes in the types of activities to which members of the military are exposed, U.S. military forces themselves are becoming increasingly diverse. Racial and ethnic composition of the American military force is changing, and, with more minorities involved in military actions, assessment measures must be developed that are culturally sensitive and broadly based to permit accurate evaluations and comparisons across minority groups. Similarly, women are represented in the military in greater numbers, and their range of responsibilities and experiences has greatly expanded. Assessment instruments that are at once sensitive to different gender-based experiences in military assignments and also representative of women's unique responses to military stressors require special consideration. Thus we culminate this chapter with a discussion of strategies that will assist professionals in the successful development of instruments that meet these criteria.

MULTIMODAL ASSESSMENT

A comprehensive assessment of military-related PTSD requires a thorough evaluation of PTSD symptoms and stressors within a broad-based evaluation of general psychopathology (see Keane, Wolfe, & Taylor, 1987). Typical parameters for assessment include the individual's level of functioning within developmental, social, familial, educational, vocational, medical, cognitive, interpersonal, behavioral, and emotional domains across the time periods prior to, during, and subsequent to military service. Such an approach provides an adequate foundation on which to create accurate diagnostic and case formulations that account for the degree to which any pre- or post-war-zone experiences may contribute to the individual's current level of functioning.

Comprehensive PTSD assessment is best achieved through the use of multiple reliable and valid instruments, as every measure is associated with some degree of error (Keane et al., 1987). Therefore, a multimethod approach that combines data derived from self-report measures, structured clinical interviews, and, when possible, psychophysiological assessment is recommended

(Keane et al. 1985; Schnurr, Friedman, & Bernardy, 2002). Such multimodal assessment of PTSD combines each measure's relative strengths, minimizes the psychometric shortcomings of any one instrument, and maximizes correct diagnostic decisions (see Weathers, Keane, King, & King, 1997, for detailed information on psychometric theory).

In addition, the external validity of PTSD assessment can be enhanced by collecting information from multiple informants and available archives. Some individuals with PTSD may have difficulty specifying their symptoms, behaviors, and experiences due to denial, amnesia, avoidance, minimization, cognitive impairment, or motivational factors. Therefore, collateral reports from friends, family members, or health care workers can provide meaningful information to corroborate and clarify aspects of the individual's experiences. Any consistent patterns of discordance among informants can yield hypotheses about the individual's characteristic attributional style or the interpersonal consequences of the individual's behavior. Similarly, consultation of all relevant archives (e.g., medical, legal, military, and educational records) may provide corroborative data to support and amplify self-reports.

Although comprehensive assessments require measures and methods that assess more than military-related experiences and distress, a review of all potential measures that could be used in multidimensional assessment is beyond the scope of this chapter. Our review focuses on the most commonly used validated methods and measurement strategies applied specifically to the assessment of military-related PTSD, including measures of exposure, structured diagnostic and clinical interviews, self-report measures, and psychophysiological assessment. Given the chapter's emphasis on military-related PTSD, we give considerable weight to the assessment of exposure to potentially traumatic experiences that occur in the context of military duties. Several unpublished measures or measures that have not yet been validated are included in this review if they have noteworthy features or historical relevance. Unless otherwise specified, all measures of PTSD presented here assess PTSD symptoms using DSM-IV criteria for PTSD (American Psychiatric Association, 1994).

Evaluation of Exposure to Military-Related Potentially Traumatic Events

Deployment in a war zone does not by itself indicate that an individual has experienced a potentially traumatic event. Similarly, members of the military can be exposed to potentially traumatic events during military duty that do not involve service in a war zone. In order to assess whether or not an individual was exposed to a potentially traumatic event during his or her military service, detailed descriptions of military duties and experiences must be obtained. Although examination of military records may be a helpful adjunct to this assessment, overreliance on these records is ill advised, as there are often inaccuracies in these documents (e.g., Watson, Juba, & Anderson, 1989).

The assessment of PTSD symptomatology is scientifically more advanced than the assessment of stressor exposure in military and war settings. For example, few measures of war-zone stressor exposure are empirically validated, and only one study compared the relative performance of available combat exposure scales (Watson et al., 1989). The following brief review identifies the primary domains that must be considered when assessing exposure to military-related traumatic events and describes the most widely used measures within each of these domains. Table 10.1 provides a summary of the number of items, content areas covered, known internal consistency, and available convergent validity with measures of PTSD. Many measures of war-zone exposure focus exclusively on detailing the intensity, frequency, and duration of traditional combat experiences involving threat of danger, loss of life, or severe physical injury (Green, 1993). Such exposure has been documented as the key risk factor for the development of PTSD among veterans (e.g., Kulka et al., 1990). Although many exposure scales have been developed, few have been empirically validated. In the research literature, the most widely used measure to assess exposure to traditional combat experiences is the 7-item Combat Exposure Scale developed by Keane et al. (1989). This measure is primarily used in studies of Vietnam veterans (e.g., Keane et al., 1998), but has also been used in studies of veterans of the Korean conflict and World War II (McCranie & Hyer, 2000). Reports of combat exposure using the Combat Exposure Scale are consistent across two evaluation points separated by at least 4 years (Niles et al., 1998).

A second domain of military exposure that is related to PTSD symptoms includes those war-zone experiences that take place outside the realm of traditional combat (e.g., Grady, Woolfolk, & Budney, 1989; Green, Grace, Lindy, & Gleser, 1990; Yehuda, Southwick, & Giller, 1992). For example, in the context of combat-related activities, many soldiers are confronted with guerrilla warfare that includes exposure to grotesque death and mutilation and many forms of abusive violence (e.g., Laufer, Gallops, & Frey-Wouters, 1984). Both the 6-item Military Stress Scale (Watson, Kucula, Manifold, Vassar, & Juba, 1988) and the 7-item Combat Exposure Index (Janes, Goldberg, Eisen, & True, 1991) include an assessment of exposure to such experiences. A 24-item Graves Registration Duty Scale, developed to assess aspects of handling human remains (e.g., matching or identifying body parts, transporting body parts) was validated on a largely male sample of Operation Desert Storm troops (Sutker, Uddo, Brailey, Vasterling, & Errera, 1994). In addition, several psychometrically validated scales focus solely on the assessment of exposure to atrocities, such as the 6-item Atrocity Scale (Brett & Laufer, cited in Yehuda et al., 1992), and the 5-item Abusive Violence Scale (Hendrix & Schumm, 1990). A more recent assessment instrument, the 84-item War Events Scale, measures observation of atrocities, participation in atrocities, and current distress related to these events (Unger, Gould, & Babich, 1998).

TABLE 10.1. Self-Report Measures of Exposure to Military-Related Potentially Traumatic Events

Scale name	Authors	Type of exposure measured	Number of items	Alpha	Strength of the relationship with measures of PTSD
Abusive Violence Scale	Hendrix and Shumm (1990)	atrocities	5	.81	.28 (IES intrusion scale); .30 (IES avoidance scale)
Atrocity Scale	Brett and Laufer (cited in Yehuda, Southwick, and Giller, 1992)	atrocities	6	—	.70 (Mississippi Scale); .39 (Figley PTSD Scale)
Combat Exposure Index	Janes, Goldberg, Eisen, and True (1991)	guerrilla warfare	7	.84	—
Combat Exposure Scale	Keane et al. (1989)	traditional combat experiences	7	.85	.43 (Mississippi Scale)
Deployment Risk and Resiliency Inventory	King, King, and Vogt (2003)	10 different deployment/ war-zone factors	201[a]	.82–.94	.12–.52[b] (PTSD Checklist)
Graves Registration Duty Scale	Sutker, Uddo, Brailey, Vasterling, and Errera (1994)	handling human remains	24	.88	.27 (Number of SCID Criterion B symptoms)
Military Stress Scale	Watson, Kucala, Manifold, Vassar, and Juba (1988)	guerrilla warfare	6	—	.57 (PTSD Interview)
Sexual Experiences Questionnaire —DoD	Fitzgerald, Magley, Drasgow, and Waldo (1999)	sexual harassment and assault	22	.93–.94	—
VESI—Specific Stressor Subscale	Wilson and Krause (1980)	combat stress, environmental stress	46	.87–.95	.23–.57 (combat scale with symptom clusters); .25–.47 (environment scale with symptom clusters)

(continued)

TABLE 10.1. *(continued)*

Scale name	Authors	Type of exposure measured	Number of items	Alpha	Strength of the relationship with measures of PTSD
War Events Scale	Unger, Gould, and Babich (1998)	atrocities	84	.92–.95	—
War Zone Stress Index	King, King, Gudanowski, and Vreven (1995)	traditional combat experience; perceived threat; atrocities; malevolent environment	72	.83–.94	—

Note. —indicates not available.
[a] although individual factor measures may be administered separately.
[b] some correlations are in the negative direction, as would be predicted.

When assessing war-zone-related exposure to potentially traumatic events, another domain to consider is the many unpleasant general factors associated with service in a war zone (e.g., bad environmental conditions, adverse climate, problems with hygiene, lack of sleep, food and water deprivation, harassment on homecoming, etc.). In the 100-item NVVRS stressor measure (Kulka et al., 1990), several items assessed malevolent conditions related to deprivation and feeling removed from the world in addition to combat, grotesque death, and abusive violence (Schlenger et al., 1992). Accordingly, a 72-item measure of combat exposure, the War Zone Stress Index, was derived from the NVVRS stressor items that assessed perceived threat and malevolent environment in addition to traditional combat and exposure to atrocities (King, King, Gudanowski, & Vreven, 1995). Enduring such adversity was found to be a significant predictor of PTSD among male and female Vietnam veterans (King et al., 1995).

Similarly, Wilson and Krause (1980) designed a 46-item Specific Stressor in Vietnam subscale in the Vietnam Era Stress Inventory (VESI) that included many items regarding exposure to ongoing harsh daily circumstances. Despite the breadth and clinical acumen reflected in this scale, only three studies have examined its psychometric properties, and each was based on a modification of the measure (Green et al., 1990; McFall, Smith, Mackay, & Tarver, 1990; McFall, Smith, Roszell, Tarver, & Malais, 1990; Wilson, 1989).

In the past decade the experience of sexual harassment and sexual assault in the military has received considerable attention. Unfortunately, this type of victimization is quite common among those in the military, with high rates of

victimization for both male and female personnel. The largest investigation of sexual trauma during military service, conducted by the Department of Defense (DoD) in 1995, reported annual rates for sexual harassment of 78% among women and 38% among men (43% overall) and rates for attempted or completed sexual assault of 6% for women and 1% for men (2% overall; Bastian, Lancaster, & Reyst, 1996). Sexual trauma in the military does not occur only during training or peacetime, and, in fact, the stress of war may be associated with increases in rates of sexual harassment and assault. Research with female Operation Desert Storm military personnel established that rates of sexual assault (7%), physical sexual harassment (33%), and verbal sexual harassment (66%) were higher than those typically found in peacetime military samples (Wolfe et al., 1998). The Sexual Experiences Questionnaire—DoD (Fitzgerald, Magley, Drasgow, & Waldo, 1999) is a military-specific version of the most widely used measure of sexual harassment. This instrument is the first measure of sexual harassment designed to meet traditional standards of reliability and validity. It is sensitive to the occurrence of sexual harassment and has been found to predict important psychological and organizational outcomes (Fitzgerald, Swan, & Magley, 1997). In addition, Wolfe, Brown, Furey, and Levin (1993) developed the Wartime Stressor Scale for Women to assess the social and environmental context of war-zone exposure specifically for women soldiers, including questions about sexual discrimination as well as sexual assault.

One recently developed measure, the Deployment Risk and Resilience Inventory (King, King, & Vogt, 2003), combines the assessment of traditional combat experiences with the assessment of a range of potentially traumatic war-zone and deployment experiences that occur outside of the realm of traditional combat. The 201-item inventory combines 14 measures that assess risk and resilience factors associated with possible militatry deployment stress reactions including two predeployment/prewar factors, 10 deployment/war-zone factors, and two postdeployment/postwar factors. The deployment/war-zone factors assessed are "sense of preparedness," "difficult living and working environment," "concerns about life and family disruptions," "deployment social support," "sexual harassment," "general harassment," "perceived threat," "combat experiences," "exposure to the aftermath of battle" and "self-reports of nuclear, biological, or chemical exposures." Any of the individual factor measures may be administered separately and the wording of all items is appropriate for contemporary military deployments. Initial psychometric evidence for this inventory is strong, suggesting that it holds great promise for reliably assessing a range of military-related potential traumatic events (King, King, Vogt, Knight, & Samper, 2004).

With the advent of DSM-IV (American Psychiatric Association, 1994), exposure to a traumatic event was defined both in terms of objective and subjective criteria. Criterion A of the PTSD diagnostic critieria specifies that a traumatic event must involve actual or threatened injury to oneself or others

(criterion A1) and must engender concomitant feelings of fear, helplessness, or horror (criterion A2). Unfortunately, not one of the measures of military-related trauma exposure reviewed here includes assessment of the three specified emotional response domains indicated in criterion A2. However, two extensive structured interviews that assess lifetime exposure to all potentially traumatic events, including military-related experiences—the Potential Stressful Events Interview (Falsetti, Resnick, Kilpatrick, & Freedy, 1994; Resnick, Falsetti, Kilpatrick, & Freedy, 1996), and the Evaluation of Lifetime Stressors (Krinsley et al., 1994; Corcoran, Green, Goodman, & Krinsley, 2000)—include assessments of fear, helplessness, and horror. Similarly, many checklist measures of lifetime trauma exposure, including the widely used 24-item Traumatic Life Events Questionnaire (Kubany et al., 2000) assess emotional responses to a range of potentially traumatic events, including exposure to a war zone or combat.

Evaluation of PTSD Symptoms among Military Personnel

Structured Clinical Interviews

Several structured diagnostic interviews were developed for the assessment of PTSD as modules of comprehensive diagnostic tools or as independent PTSD measures. Modules offer expediency in diagnosis but have typically yielded only dichotomous symptom ratings. Interviews focused solely on PTSD diagnostic criteria often require more time investment, but many yield evaluation of symptoms on a continuum. We briefly present examples of each type of interview format that can be used to diagnose PTSD among military personnel.

PTSD modules are available in the Diagnostic Interview Schedule—IV (DIS-IV; Robins, Cottler, Bucholz, & Compton, 1997), the Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Williams, & Gibbon, 1997), and the Anxiety Disorders Interview Schedule—IV (ADIS-IV; Blanchard, Gerardi, Kolb, & Barlow, 1986; Di Nardo, Brown, & Barlow, 1994). Of all these measures, the SCID has demonstrated high interrater reliability and is strongly correlated to other measures of PTSD.

PTSD structured interviews used with veterans include the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1990; Blake et al., 1995; Weathers, Keane, & Davidson, 2001), the PTSD Interview (PTSD-I; Watson, Juba, Manifold, Kucala, & Anderson, 1991), and the Structured Interview for PTSD (SI-PTSD; Davidson, Smith, & Kudler, 1989; Davidson, Malik, & Travers, 1997). Although all these measures performed well, the CAPS is noteworthy for the thorough analysis of its psychometric utility; its strengths include good psychometrics (e.g., alpha coefficient = .94; sensitivity = .84; specificity = .95; kappa coefficient = .78), clear behavioral anchors, a time frame concordant with that of DSM diagnostic criteria, and separate frequency and intensity ratings.

Self-Report Measures

Self-report checklists that provide information about PTSD symptomatology can be time- and cost-efficient tools in the multimethod assessment process. They can be combined to maximize efficiency, specificity, or sensitivity of the assessment battery. Many excellent self-report questionnaires are available to assess military-related PTSD; some solely assess diagnostic criteria, some correspond to the diagnostic criteria and their associated features, and other measures broadly sample the content of the disorder. We briefly review the measures that are commonly used in assessments of military personnel.

Several short scales have been developed that assess the 17 diagnostic symptoms of PTSD. Not surprisingly, they all have relatively comparable psychometric qualities, particularly internal consistency. The PTSD Checklist (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996) has good sensitivity (.82) and specificity (.83) and is positively correlated with standard measures of PTSD (Mississippi Scale; $r = .93$; MMPI-2 PK Scale, $r = .77$; Impact of Event Scale, $r = .90$). The current version has excellent internal consistency (Cronbach alpha coefficient = .86), excellent specificity (.94 for both current and past PTSD), but weak sensitivity (current PTSD = .48, past PTSD = .48). The Purdue Post-Traumatic Stress Scale—Revised (PPTSD-R; Lauterbach & Vrana, 1996) is available in both military and civilian versions and has demonstrated good psychometric properties. However, the most recent version has yet to be validated with military populations.

Several validated self-report instruments exist that include PTSD symptoms and diagnosis and commonly associated features of the disorder. The Self-Rating Inventory for PTSD (SIP; Hovens, Bramsen, & van der Ploeg, 2002; Hovens et al., 1993; Hovens et al., 1994) consists of 22 items and was originally designed for use with Dutch World War II resistance fighters. It has extensive psychometric data and is available in both English and Dutch. The SIP includes trauma-related symptoms such as those classified under the proposed "diagnosis of extreme stress, not otherwise specified" classification (Herman, 1993). When compared with the CAPS as gold standard, the PTSD subscale of the SIP possesses excellent sensitivity (.92) and moderate specificity (.61) within a sample of civilian psychiatric outpatients and Dutch resistance fighters. The 43-item Los Angeles Symptom Checklist (LASC; King, King, Leskin, & Foy, 1995) also appears to be a psychometrically sound measure of PTSD symptoms among Vietnam veterans (alpha coefficient .91 for 17-item index and .94 for full index; test–retest reliability = .94 for the 17-item index and .90 for full index), although specificity and sensitivity data from military samples are still needed.

Several measures perform quite well in predicting PTSD diagnostic status that are not based directly on DSM diagnostic criteria. In fact, two of the primary self-report measures in the NVVRS, the Keane PTSD Scale of the MMPI (PK scale; Keane, Malloy, & Fairbank, 1984) and the Mississippi Scale for

Combat-Related PTSD (Keane, Caddell, & Taylor, 1988) were designed to measure broadly the construct of PTSD. The 49-item MMPI PK scale and the 46-item MMPI-2 PK have moderate or better psychometric performance, although the sensitivity and specificity of the PK scales have varied from study to study (e.g., Graham, 1993; Keane et al., 1984; Lyons & Keane, 1992; Query, Megran, & McDonald, 1986; Watson, 1990). In studies in which the diagnostic criterion is strongest (e.g., SCID or CAPS), the PK's performance is very good. When more questionable diagnostic criteria are employed (e.g., chart diagnosis), the PK has had more modest success. In addition, the MMPI-2 PK scale works as well when it is applied as a separate measure as it does when embedded within the full MMPI (Graham, 1993; Herman, Weathers, Litz, & Keane, 1996; Litz et al., 1991; Lyons & Scotti, 1994).

The 35-item Mississippi Scale for Combat-Related PTSD (Keane et al., 1988) is one of the most widely used PTSD measures among veteran populations (e.g., Kulka et al., 1990; McFall, Smith, Mackay, & Tarver, 1990; Perconte et al., 1993) and is available in numerous languages (e.g., Dutch, Spanish). Three abbreviated versions of the scale also show promising correlations (.90–.96) with the original scale (Fontana & Rosenheck, 1994; Hyer, Davis, Boudewyns, & Woods, 1991; Wolfe, Keane, Kaloupek, Mora, & Wine, 1993).

The 15-item Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979; Zilberg, Weiss, & Horowitz, 1982; Weiss & Marmar, 1997), also used in the NVVRS preliminary validation trial (Kulka et al., 1991), was found to have less useful diagnostic utility than either the PK or Mississippi Scale, but nonetheless it performed as a good indicator of PTSD status (sensitivity = .92; specificity = .62; correct classification = 81.6%). The IES has been translated widely and used with many different national military forces (e.g., Kulka et al., 1990; Schwarzwald, Solomon, Weisenberg, & Mikulincer, 1987). Recent additions to the IES (i.e., IES—Revised; Weiss & Marmar, 1997) included the items associated with increased arousal and yield a more complete assessment of the PTSD diagnostic criteria.

Weathers and his colleagues (Weathers, Litz, Keane, Herman, Steinberg, Huska, & Kraemer, 1996) derived a 25-item War-Zone-Related PTSD subscale (WZ-PTSD) that is embedded in the Symptom Checklist 90—Revised (SCL-90-R; Derogatis, 1977). In two different samples, this scale demonstrated that the WZ-PTSD measure clearly outperforms the SCL-90-R Global Severity Index in identifying cases of PTSD.

Psychophysiological Assessment

Psychophysiological assessment can provide unique information on the extent of autonomic hyperarousal and startle responses in PTSD (Orr & Roth, 2000). In general, combat veterans with PTSD demonstrate significantly more psychophysiological reactivity to combat stimuli than do comparison groups, such as nonveterans with psychiatric disorders and combat veterans without

psychiatric disorders (Keane et al., 1998; Prins, Kaloupek, & Keane, 1995). However, the specificity of psychophysiological assessment typically exceeds its sensitivity. A psychophysiological assessment of PTSD usually involves presenting an individual with standardized stimuli (e.g., combat photos, noises, odors) or personalized cues of traumatic life events (e.g., taped scripts of their traumatic experiences). Psychophysiological indices that can be assessed include heart rate, blood pressure, muscle tension, skin conductance level and response, and peripheral temperature (e.g., Blanchard, Kolb, Pallmeyer, & Gerardi, 1982; Orr et al., 1990; Pitman, Orr, Forgue, de Jong, & Claiborn, 1987; Shalev, Orr, & Pitman, 1992, 1993). Again, because no one psychophysiological index is error free, convergent measures of psychophysiology are recommended. Although psychophysiological assessment once required elaborate and expensive laboratory equipment, portable systems have made this technique more feasible than ever before. Orr, Metzger, Miller, and Kaloupek (Chapter 11, this volume) provide a more thorough discussion of the findings from studies of the psychophysiological assessment of PTSD. Findings in male and female veteran populations demonstrate the usefulness of this approach across genders (Peirce, Newton, Buckley, & Keane, 2002).

Interpretation of the Components of Multimodal Assessment

The ideal battery for the assessment of military-related PTSD incorporates data derived from the multiple methods described here. However, inconsistency across these domains is common in assessment and may result either from measurement artifacts or as manifestations of varying presentations of the disorder. Distinguishing noise from signal among these multiple measures is a complex task that relies on expertise in both clinical and empirical domains. Despite the wealth of psychometric data available regarding the performance of individual instruments, few studies are available that examine the relative contributions of particular instruments within a battery to the overall prediction of PTSD status. Two distinct strategies have evolved over time. In the NVVRS, a statistical algorithm was designed to approximate the process of clinical decision making and was used to reconcile cases in which disagreements occurred among various PTSD indicators (Kulka et al., 1991; Schlenger et al., 1992). This approach may be most useful in case determination for research and may provide data to inform clinical practice. Nonetheless, clinical judgment and expertise is also needed to interpret the qualitative contributions of particular measures and the manner in which individuals may minimize or distort their experiences. Thus a fundamental approach to interpretation incorporates a combination of good clinical skill and empirical knowledge about the relative psychometric qualities of each indicator. To facilitate the interpretation of multimodal data, Keane and his colleagues (1987) suggested the use of consensus among clinical team members who represent expertise in different arenas. This approach ensures that all data are considered, that bias is minimized, and that empirical and psychometric concerns are

appropriately evaluated so that the most accurate interpretation of the data can be attained.

NEW CHALLENGES TO MEASURING MILITARY-RELATED PTSD

New Issues in Assessment of Military Trauma Exposure

In the current geopolitical climate, the types of missions in which military personnel will participate will be markedly different from the traditional conflicts of the past. In the coming years, it is likely that many of the more significant efforts of the U.S. Armed Forces will focus on multilateral peacekeeping, humanitarian relief, and peace enforcement operations with the goal of confronting regional instabilities that threaten world interests (Henshaw, 1993). Evidence of this type of military "humanitarianism" can be seen in recent missions, including "Operation Provide Comfort" in Kurdistan, the goal of which was to supply relief to refugees; "Operation Sea Angel" in Bangladesh, in which forces provided relief to victims of a flood; and "Operation Restore Hope," the purpose of which was to provide humanitarian aid and peacekeeping in Somalia (Moskos & Burk, 1994). Data on the psychological adjustment of participants in the peace enforcement mission in Somalia suggest that PTSD can develop as a result of the military-related stressors involved with this type of duty (Orsillo et al., 1994). In addition, recent military operations with a more traditional combat focus also provide exposure to a unique set of potentially traumatic events. For example, veterans of Operation Desert Storm and Operation Iraqi Freedom were confronted with the fear of weapons of mass destruction, including biological and chemical weapons (Norwood, Holloway, & Ursano, 2001; Knudson, 2001).

Although existing measures of military-related PTSD will most likely be appropriate for assessing symptom presentation, novel approaches to measuring exposure to potentially traumatic events must be developed to reflect the unique stressors that characterize these types of missions. Many factors suggest that, as the issues surrounding military missions change, so too does the direction mental health professionals need to take in assessing exposure to military-related traumatic events.

For instance, one challenge inherent in the assessment of trauma exposure among personnel engaged in these new military operations is the diverse nature and character of the missions. The actual role of participants in these experiences may vary widely. On the one extreme are conventional observer missions, in which forces serve as impartial observers of a truce between two or more formerly warring parties (Henshaw, 1993). In this situation, the goal of the mission is usually short term and quite clear, and the presence of troops is supported by all parties. However, modern military operations can range in levels of intervention to include missions that require a variety of activities that could potentially result in more direct exposure to potentially traumatic

events, including the delivery of humanitarian assistance to starving people, disarmament of or preventative peacekeeping between potentially hostile forces, and activities involving conventional military capabilities (Eyre, Segal, & Segal, 1993; Henshaw, 1993) such as in Operation Enduring Freedom in Afghanistan or Operation Iraqi Freedom.

As mentioned, a multidimensional approach to the measurement of military-stressor exposure includes assessment of the general malevolence of the environment and the individual's subjective emotional response to traumatic events, in addition to an assessment of their participation in a wide range of military activities. Anecdotal reports from individuals who have served in peacemaking and peacekeeping operations suggest that a range of environmental stressors are often present (Grinfeld, 1993; Wilkinson, 1994). Findings from a preliminary survey of individuals serving in Somalia support the notion that these separate components of exposure are independently associated with the development of PTSD among peace enforcement participants (Orsillo et al., 1994). Thus it is important to consider these dimensions in the measurement of exposure within the new military missions as well.

Preliminary accounts also imply a wide range of subjective emotional responses among individuals who take part in these new types of military operations. Participants are often required to maintain the difficult balance of power with restraint in situations that could range in political climate from mildly confusing and disorganized to seriously and dangerously chaotic (Henshaw, 1993). Thus peacekeepers may feel overwhelmed with the boredom, isolation, and cultural deprivation that often accompanies the "observer" as compared to "intervener" role of their duties (Harris, Rothberg, Segal, & Segal, 1993), or they may become frustrated with the relatively inactive role they play in the peace process (Mortensen, 1990). Military personnel may also become disillusioned with their duties, as their role in the mission will not always result in an objectively defined success. Although the problems defined by the mission may be amenable to some degree of change, in many cases they may not always be resolvable (Henshaw, 1993).

Given the constantly evolving nature of modern military operations, multidimensional exposure scales may need to be tailored on a case-by-case basis to capture the full range of events included in each new military mission. In the next section, we delineate the steps one can take to develop a clinically sensitive measure of exposure that can be used in this rapidly changing military environment.

Suggestions for the Development of Military Stress Exposure Scales

The first step an assessor must take in developing a measure of exposure is initial item selection (content validity). Items for a test are most often generated and chosen on the basis of their face validity in relation to a theoretical understanding of the concept to be measured (Nunally, 1973). This pool of initial items can be developed in several ways. If one does not have direct contact

with participants in the mission, there are at least two alternative methods of obtaining content information. One approach is to survey a panel of experts in the field of military-related PTSD who can use their clinical expertise in the determination of appropriate items for an exposure scale. Another option is to gather descriptive information presented in media accounts of anecdotal reports by participants on the mission. Although these approaches can result in the development of face-valid items, the best manner in which to collect content information is to directly sample participants.

Information for item development can be directly collected from participants in many ways. One approach is to construct a scale based on the techniques described here, and then to derive feedback regarding the items from individuals who have served, or who are currently serving, in the mission. Another method involves incorporating descriptive data obtained through clinical interviewing into the development of items. Although both these approaches can be easily implemented, a potentially more effective and rigorous technique that can be used to collect this type of qualitative data for item generation is the use of focus group interviewing.

Focus group interviewing is a technique by which information about a novel content area can be quickly and inexpensively obtained by observing participants interact with one another regarding a topic provided by the leader (Morgan, 1988). To use this methodology, an interested researcher would construct a focus group of participants who have been deployed to serve in the mission. Through directed group discussions about the nature of their duty, the unique stressors and conflicts that participants face should become readily apparent and can be incorporated into a measure of exposure. The selection of focus group members will inevitably vary according to the purpose of the assessment, but the group should typically include and consider the experiences of a wide variety of participants. For instance, different gender or ethnic groups may encounter very different stressors in the military, so it may be important to create groups that accurately reflect the demographics of the sample of interest. In addition, including participants of various branches and ranks of the military in a group or running subgroups of special individuals (e.g., a "front line" Marine focus group) may be fruitful. For instance, it has been theorized that members of elite combat units who are self-selected and subsequently trained and socialized in traditional combat activities may have a more difficult adjustment to the types of duties required in peacemaking (Segal & Segal, 1993). Finally, sampling groups widely across the time period of the mission will help to elicit data regarding the changing nature of the potentially traumatic events.

In addition to content, the method employed to format the questions that compose the scale needs attention (Golden, Sawicki, & Franzen, 1984). Items can either be open ended, allowing respondents to freely answer a question including any information they feel is relevant and pertinent, or restricted, such as a forced-choice (true/false) or multiple-choice item. Open-ended questions allow more personalized responses and may be helpful in providing detailed

information about experiences in the war zone. However, these items are difficult to quantify and score. On the other hand, restricted items, although more standardized, are easier to interpret in a group or normative context. An assessment approach that includes both types of items and thus combines nomothetic and ideographic methodologies may be the most flexible in allowing clinicians to better understand exposure experiences.

Several surveys developed at the National Center for PTSD at the VA Boston Healthcare System successfully incorporated many of these methodological nuances into instrument development. For instance, Wolfe, Brown, and Kelley (1993) designed a survey to investigate the multidimensional components of exposure among individuals who served in Operation Desert Storm. Items were generated both from previously validated exposure measures and from feedback from Operation Desert Storm veterans, and the item format allowed for both fixed and open-ended responses.

In addition, Litz and his colleagues (Litz, Moscowitz, Friedman, & Ehlich, 1995) designed a survey to evaluate the long-term psychosocial sequelae that stem from participation in the peacekeeping mission in Somalia during Operation Restore Hope (ORH; later Operation Continue Hope, OCH). Items were generated based on anecdotal descriptions of events experienced by military personnel who were deployed to Somalia and qualitative information about the nature of the mission derived from debriefing groups. This survey also incorporated some open-ended questions to allow participants to report unique aspects of the stressors they faced. Each of these efforts serve as models for the future development of psychometrically sound measures of exposure.

Cultural Considerations in the Assessment of Military-Related PTSD

Another challenge to the assessment of military-related PTSD is the need to develop instruments that are culturally sensitive. Concurrent with changes in the function of the military, the demographic composition of the U.S. Armed Forces has also dramatically shifted. Over the past 20 years the proportion of women in the armed forces has grown from less than 2% to more than 15%, and the percentage of African Americans serving has doubled from 10 to 20% (Office of the Assistant Secretary of Defense, 2003). This change in the demographics of the armed forces necessitates that cultural and gender-based considerations be taken into account in stress assessment.

There are several clinical descriptions of responses to traumatic events that underscore the importance of culturally sensitive instrumentation. Racial conflicts, discrimination, bicultural struggles, and identification with the "enemy" have all been cited as stressors commonly experienced by minority veterans (Kraft, 1993; Loo, 1994; Parson, 1985). As well, differences in the level of exposure to war-zone related stressors and the severity of PTSD symptoms experienced between ethnic minority and Caucasian veterans have been empirically documented (e.g., Frueh, Brady, & Arellano, 1998; Green, Grace,

Lindy, & Leonard, 1990; Kulka et al., 1990). Although it is difficult to meaningfully interpret these group differences, some investigators have begun to identify possible mediators of the effect of ethnicity on the development of PTSD, such as discrimination and alienation (e.g., Ruef, Litz, & Schlenger, 2000). Unfortunately, much of the research in this area is limited by the use of assessment instruments that may not be optimal for all cultures present in the United States (Marsella, Friedman, & Spain, 1993).

Guidelines to Ethnocultural Assessment

In an effort to improve the research on ethnocultural aspects of psychopathology, several authors compiled guidelines for culturally sensitive assessment. First, an assessor should be clinically sensitive to ethnic issues and aware of his or her own prejudices and biases (Penk & Allen, 1991; Westermeyer, 1985). Second, researchers ought to go beyond comparing categories of ethnic groups as the sole means of understanding ethnocultural variability (Marsella et al., 1993: Penk & Allen, 1991). Moreover, the level of an individual's acculturation to the dominant culture must be assessed rather than assumed by their ethnic identity. Finally, it is key that instrumentation be developed that maintains equivalence across several different cultural groups.

Dimensions of Cultural Equivalence

Cultural equivalence in assessment is typically established within several different domains: content, semantic, technical, normative, and conceptual equivalence (Flaherty et al., 1988; Lonner, 1985; Marsella & Kameoka, 1988). First, it is important to ensure that the content being measured is relevant to the phenomena of each culture being studied. Next, semantic equivalence should be obtained to ensure, through translation and back translation by bilingual experts, that the meaning of each item is the same in each culture. Measures are determined to be technically equivalent when the method of assessment (e.g., self-report, interview) results in comparable comfort and familiarity between cultures. For instance, it is important to be aware, in developing a culturally sensitive assessment instrument, that a Likert-type scale may be meaningless to some ethnic groups (Flaskerud, 1988; Kinzie et al., 1982). Normative equivalence refers to the importance of using local norms to interpret findings. In many cases, because of cultural differences in definitions of problematic behavior, it may be inappropriate to use the criterion for caseness developed in one culture to determine the boundaries of pathology in another. Finally, it is crucial that conceptual equivalence be determined. This ensures that the instrument is measuring the same theoretical construct, such as shame or dependency, in each culture. Keane, Kaloupek, and Weathers (1996) provide a more thorough description of the process necessary for developing instruments necessary to appropriately and equivalently assess trauma across cultural and ethnic groups.

SUMMARY

Assessing traumatic life experiences and PTSD among veterans of military service is conceptually and practically challenging. Military service varies from one action to the next, and in the current era clinicians and researchers will need to modify and alter their approaches to assessment in accordance with the particular details of the military activities involved. Moreover, the demographic composition of the forces is continuing to vary, and instruments need to be developed that are sensitive to the cultural nuances of the cultures within our population. Efforts to ensure that women and ethnic minority populations are represented in all phases of instrument development are important to the ultimate usefulness of the assessment instruments, whether they be primarily for use in the clinic, in the field, or in laboratory research studies.

Today many instruments are available to assess military-related trauma exposure and associated PTSD. These instruments are responsible for the great expansion of our knowledge since 1980 on the psychological, social, and physical effects of traumatic events. Our ability to appropriately assess both trauma exposure and PTSD has led to widespread recognition and acceptance of the central role that these phenomena play in the lives of individuals in our society. Future research on military trauma exposure and PTSD will continue to figure prominently in the development of a humane and sensible public policy toward individuals who serve in the military. The development of assessment instruments and methods that are reliable and valid will assist immensely in that process.

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